



The Time-Variant Degradation of a Photovoltaic System

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Résumé en anglais

This article presents a method developed for carrying out the energy production estimation considering the energy losses in different components of a photovoltaic (PV) system and its downtime effect. The studied system is a grid-connected photovoltaic system including PV modules, wires, and inverter. PV systems are sensitive to environmental conditions (UV radiation, temperature, humidity) and all components are subjected to electrical losses. The proposed method allows obtaining the production of photovoltaic system and its availability during a specified period using meteorological data. The calculation of the production takes into account the downtime periods when no energy is delivered in the grid during this period. The time-to-failure and the time-to-repair of photovoltaic system are considered following a Weibull distribution. This method permits to have a best estimation of the production throughout the lifetime of the photovoltaic system.

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